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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,938	01/03/2007	Takashi Ozaki	1592-0169PUS1	7521

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EXAMINER
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EVERHART, CARIDAD

ART UNIT	PAPER NUMBER
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2891

NOTIFICATION DATE	DELIVERY MODE
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04/23/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/549,938	<b>Applicant(s)</b> OZAKI ET AL.	
	<b>Examiner</b> Caridad M. Everhart	<b>Art Unit</b> 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9-20-05;12-20-05;2-27-08</u> .                                | 6) <input type="checkbox"/> Other: ____.                          |

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4,6-8, and 11-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 6,869,892) in view of Yang et al (US 6,074,486).

Suzuki et al discloses a method and a apparatus for oxidation of semiconductor workpieces which include polysilicon surfaces(col. 1, lines 5-8 and 14-19). Dry oxidation has been found to provide superior oxidized film qualities over wet oxidation(col. 1,lines 34-40). Active oxygen and active hydroxyl species are generated in the reaction vessel(col. 2, lines 64-67 and col. 3,lines 1-4). The wafer boat is vertically loaded and unloaded into the reactor (col. 2,lines 52-58). High uniformity of the oxide can be achieved by positioning the gas inlet ports(col. 3, lines 64-67 and col. 4, lines 1-7). The flow is independently controlled to the gas nozzles for the reductive gas which are placed in different positions (col. 4, lines 8-20). A controller controls the flow rates(col. 5, lines 20-28). The vertical wafer boat is vertically taken in and out of the vessel(col. 6, lines 22-27). Heating wire surrounds the vessel (col 6, lines 53-60). Reduction gas is supplied midstream in the vessel(col. 7, lines 17-25). The oxidative gas is oxygen and the reductive gas is hydrogen(col. 8, lines 5-10). The upstream gas region is the lower region of the vessel(col. 7, lines 47-58). The gas injection is in the lower region(col. 7, lines 58-64), with additional reductive gas injection in the midlevel regions(col. 7, lines 17-25 and Fig. 7). There is also provided a gas exhaust(col. 9, lines 1-4). Mass flow controllers control the gas flows(col. 7, lines 7-15). The rates for each of the reductive gas inlets is controlled separately(col. 9, lines 58-64). The pressure of the vessel is below atmospheric pressure(col. 10, lines 33-40). Fig. 7 shows that the inlet nozzles are at the inner walls of the vessel. The wafer boat is a rotating wafer boat(col. 6, lines 47-53).

Suzuki et al is silent with respect to the recited placement of the nozzles.

Yang et al disclose an apparatus for thermal precessing which includes a plurality of gas supply nozzles of different heights(col. 4, lines 1-10 and 14-23). The supply for each nozzle can be separate or can be the same with branching from the same source for some of the nozzles(col. 4, lines 23-33 and col. 6, lines 43-63). The wafers are on a wafer boat that can rotate(col. 4,lines 40-47). The improvement of having the different heights of the nozzles is that the conditions of the wafers will not vary depending on the position of the wafer so much as with the prior art (col. 2, lines 34-40). The choosing the height of the nozzles for different applications in the art is within the ordinary skill in the art , as disclosed by Yang et al (col. 6 lines 33-40). The heights of some nozzles are at the top of the stack of wafers or the top of the chamber and some are at the middle(col. 4, lines 14-23). The top of the stack of wafers is upstream from the wafers, as the gas flows down toward the exhaust opening(Fig. 3 shows the exhaust connected to the vacuum pump 86).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the nozzle placement taught by Yang et al in the method and apparatus taught by Suzuki et al in order to obtain the uniformity of the gas environment for the wafers taught by Yang et al.

Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al in view of Yang et al as applied to claim 1 above.

Suzuki et al in view of Yang et al is silent with respect to the polysilicon being CVD polysilicon.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the polysilicon taught by Suzuki et al in view of Yang et al could be deposited by CVD because CVD method of depositing polysilicon is conventional in the art.

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al in view of Yang et al as applied to claim 1 above.

Suzuki et al in view of Yang et al is silent with respect to the recited ratio of the oxygen and the hydrogen.

Fig. 3 shows various relative flow rates of hydrogen and oxygen expressed as a ratio of hydrogen to the sum of the hydrogen and oxygen flow rates. In col. 10, lines 32-40 Suzuki further discloses a 90 percent value of this ratio, which would require that the flow rates of hydrogen to hydrogen plus oxygen be within the recited range.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the disclosure made by Suzuki et al in view of Yang et al encompasses the recited flow rate ratio because the ratio disclosed by Suzuki et al includes the recited ratio.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2891

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caridad Everhart/  
Primary Examiner  
AU 2891

4-17-2008